Fig. 1

Figure 1: Sample Protected Storage Grid deployment
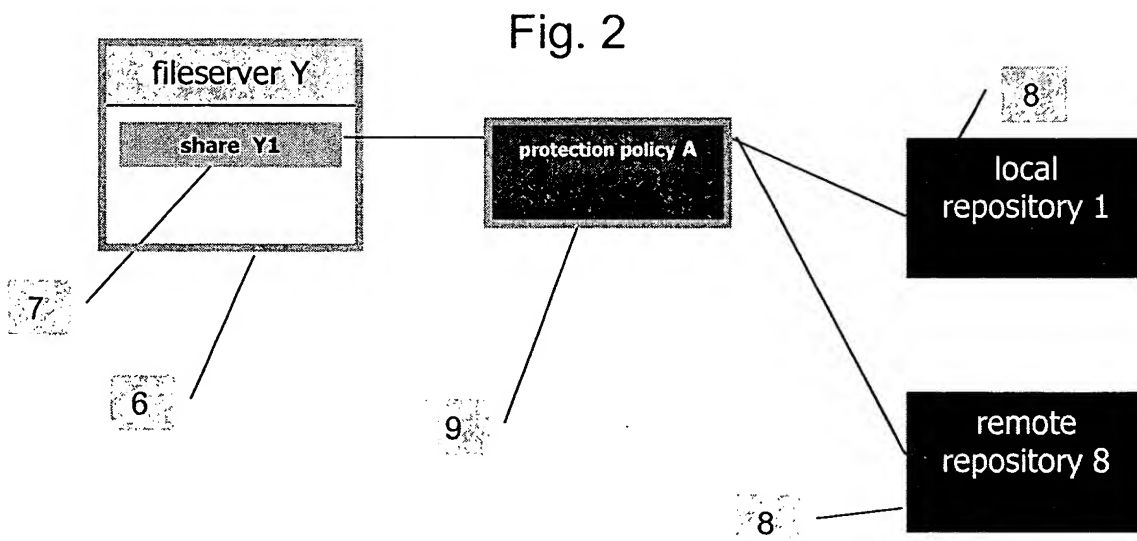
Fig. 2

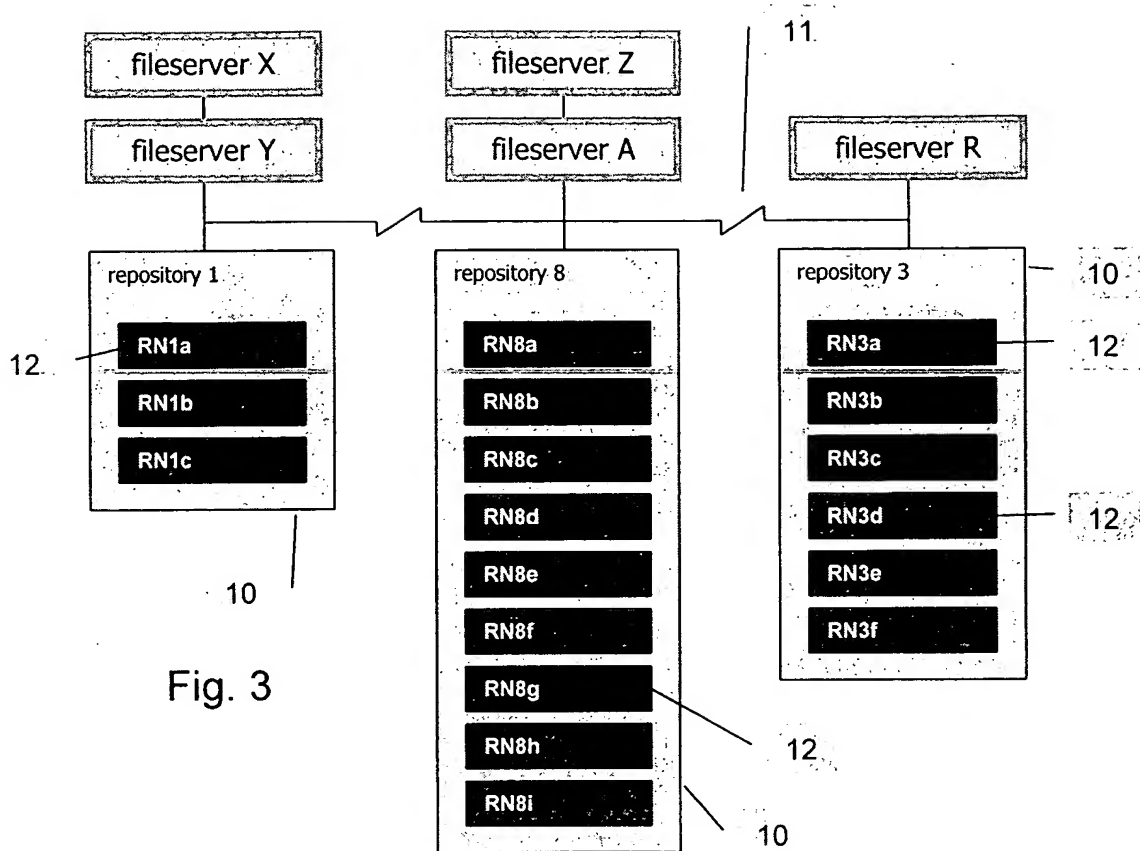Figure 2: Protection policy

Fig. 3

FIG 3: Repository Nodes within Repositories

Fig. 4

General
CIFS Sharing
NFS Sharing
FTP Sharing
Protection Policy

13
14
15
16
17
18
19
20
21

Policy Identification

Share: **GP_Marketing/Marcom2**

Protect this share: ☑

Protection Policy Name: marcom2

Description: 2 Local, 0 Remote

User Data: D135

Protection Management

Backup Frequency: 1 Hour ▾

Replicas: 2 ▾ Replicas in **New York/Hudson**

1 ▾ Replicas in New York/3 Charles ▾

0 ▾ Replicas in Boston ▾

Version Management

Keep Version History ☑

Version Compression: Delta Compression ▾

Version Compaction: ☑ Keep only one daily version after 7 days

☑ Keep only one weekly version after 4 weeks

☑ Keep only one monthly version after 12 months

☑ Keep only one version after 2 years

Advanced Options [Hide]

☐ Purge all versions of files that are deleted from this share 7 days after they are deleted.
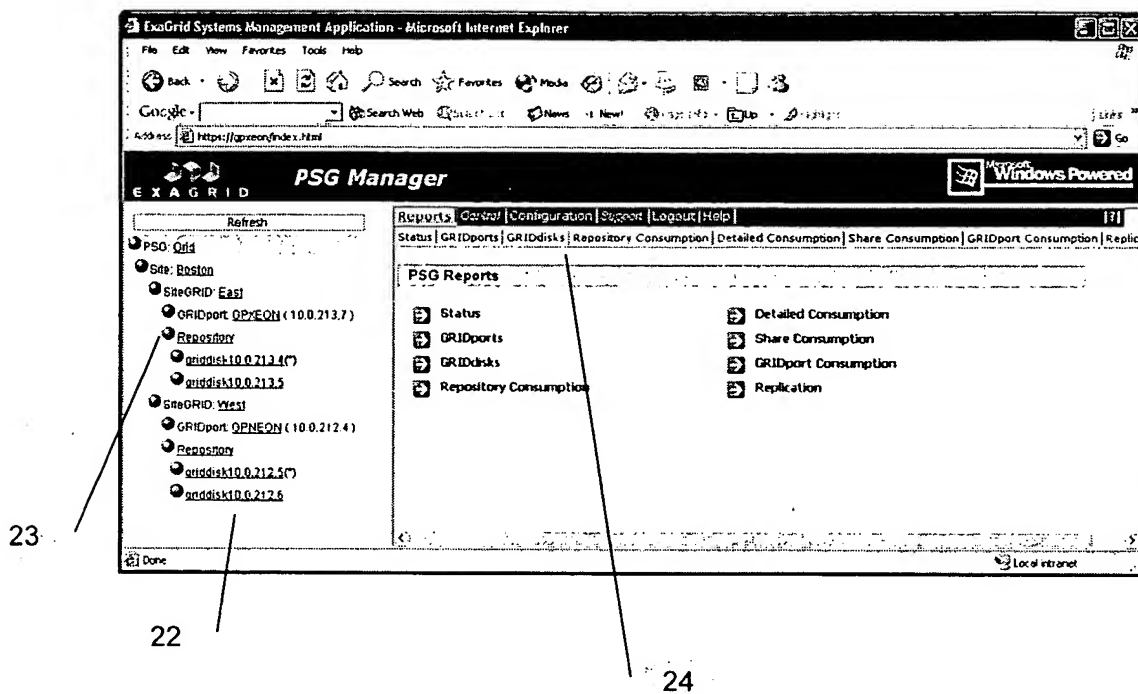
Caching Level: High ▾

FIG 4: Protection Policy
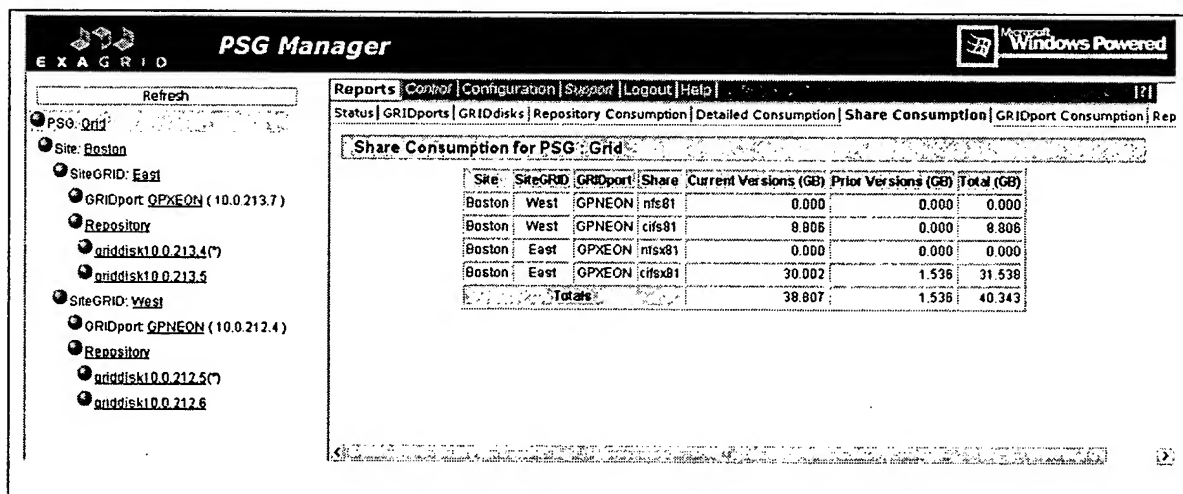
FIG 5: Web-based Management Application

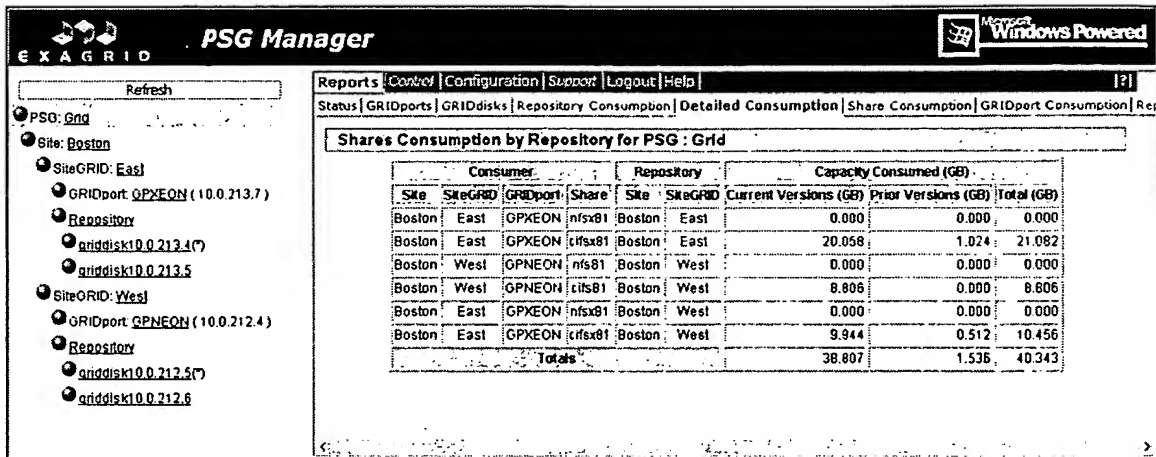FIG 6: Capacity per share chargeback reporting

FIG 7

PSG Manager

Status | GRIDports | GRIDdisks | Repository Consumption | Detailed Consumption | Share Consumption | GRIDport Consumption | Re

Refresh

PSG: Grid
Site: Boston
  SiteGRID: East
    GRIDport: GPXEON (10.0.213.7)
    Repository
      griddisk10.0.213.4(*)
      griddisk10.0.213.5
  SiteGRID: West
    GRIDport: GPNEON (10.0.212.4)
    Repository
      griddisk10.0.212.5(*)
      griddisk10.0.212.6

Shares Consumption by Repository for PSG : Grid

Consumer				Repository		Capacity Consumed (GB)		
Site	SiteGRID	GRIDport	Share	Site	SiteGRID	Current Versions (GB)	Prior Versions (GB)	Total (GB)
Boston	East	GPXEON	nfsx81	Boston	East	0.000	0.000	0.000
Boston	East	GPXEON	cifsx81	Boston	East	20.058	1.024	21.082
Boston	West	GPNEON	nfs81	Boston	West	0.000	0.000	0.000
Boston	West	GPNEON	cifs81	Boston	West	8.806	0.000	8.806
Boston	East	GPNEON	nfsx81	Boston	West	0.000	0.000	0.000
Boston	East	GPXEON	cifsx81	Boston	West	9.944	0.512	10.456
		Totals				38.807	1.536	40.343

FIG 7: Capacity per share per repository reporting

FIG 8

PSG Manager

Status | GRIDports | GRIDdisks | Repository Consumption | Detailed Consumption | Share Consumption | GRIDport Consumption | Re

Refresh

PSG: Grid
Site: Boston
  SiteGRID: East
    GRIDport: GPXEON (10.0.213.7)
    Repository
      griddisk10.0.213.4(*)
      griddisk10.0.213.5
  SiteGRID: West
    GRIDport: GPNEON (10.0.212.4)
    Repository
      griddisk10.0.212.5(*)
      griddisk10.0.212.6

Repository Consumption Summary for PSG : Grid

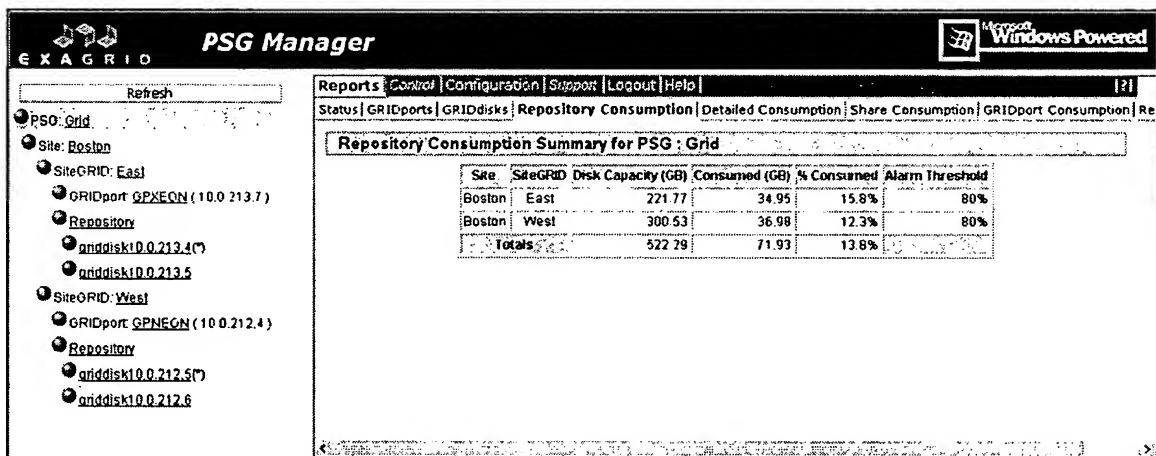| Site	SiteGRID	Disk Capacity (GB)	Consumed (GB)	% Consumed	Alarm Threshold
Boston	East	221.77	34.95	15.8%	80%
Boston	West	300.53	36.98	12.3%	80%
	Totals	522.29	71.93	13.8%	

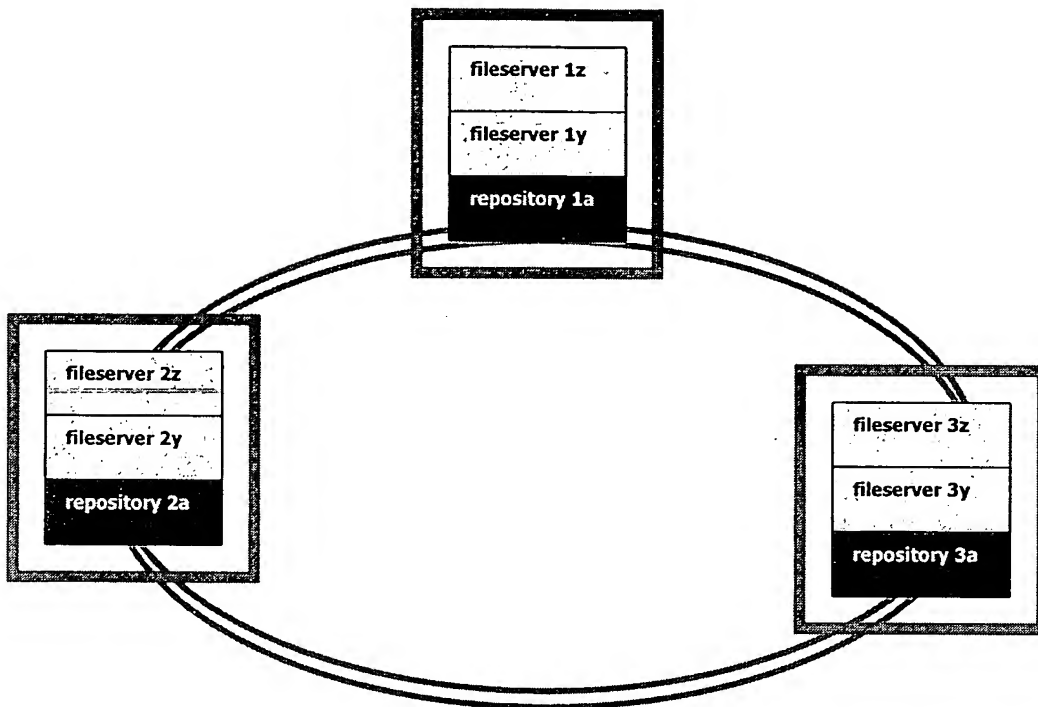FIG 8: Capacity per repository reporting

FIG 9: The present invention used as collection of distributed NAS servers, with complete local and remote data protection
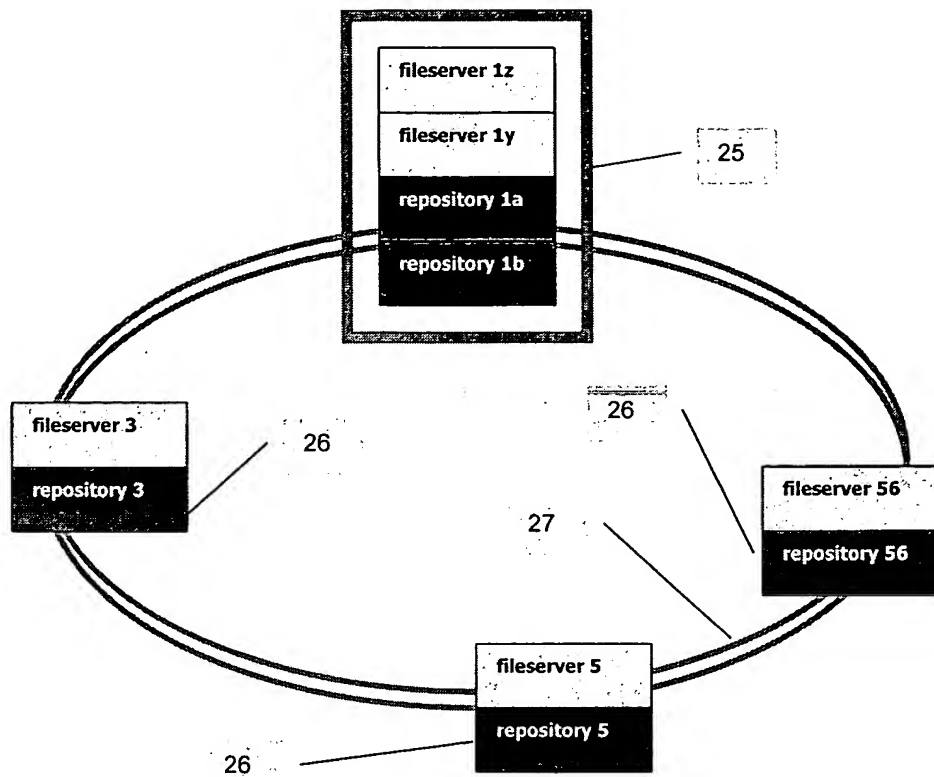
FIG 10: The present invention used in a corporation with a centralized data center and multiple remote offices
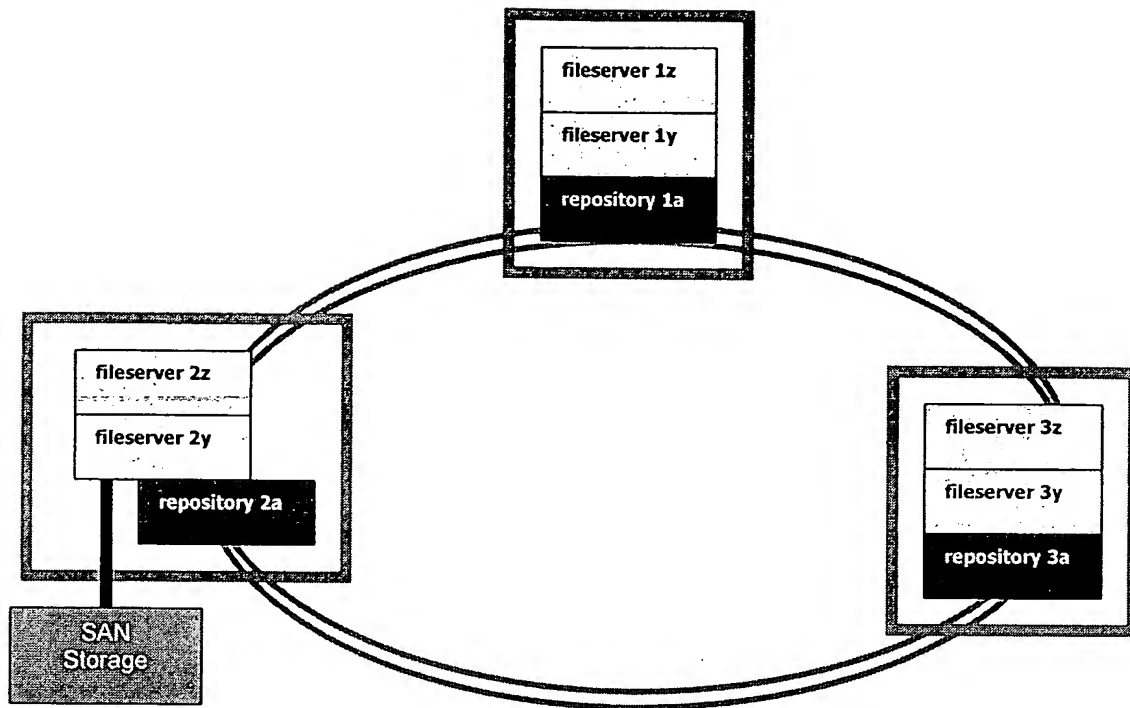
FIG 11: The present invention used to provide tiered storage services
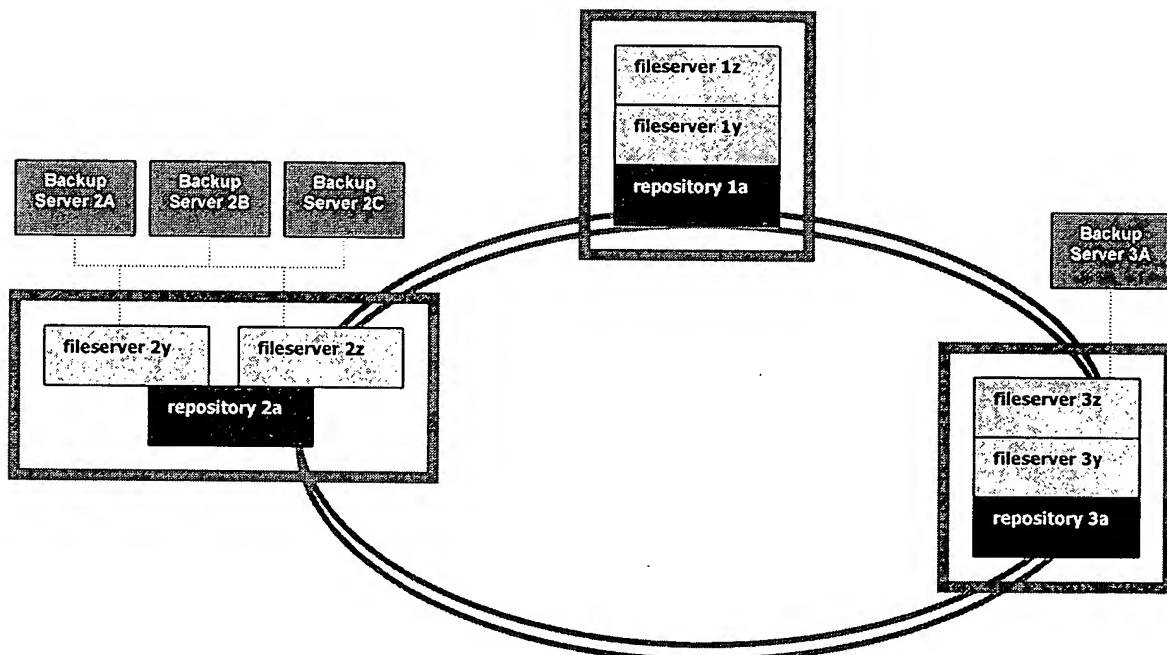for existing SAN storage

FIG 12: The present invention used as a replacement for tape drives and
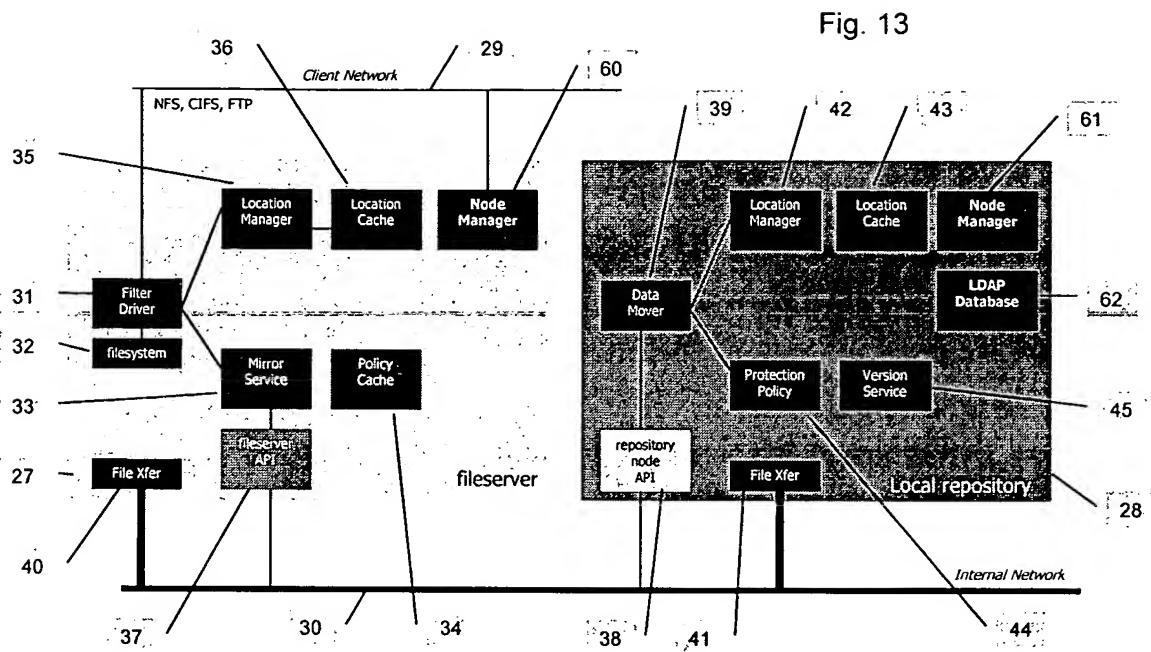tape media for traditional backups

Fig. 13

Client Network   36   29   60

NFS, CIFS, FTP

35 — Location Manager

Location Cache

Node Manager

39   42   43   61

Location Manager   Location Cache   Node Manager

31 — Filter Driver

Data Mover

LDAP Database — 62

32 — filesystem

33 — Mirror Service

Policy Cache

Protection Policy   Version Service — 45

fileserver API

fileserver

repository node API

File Xfer

Local repository

27 — File Xfer

40

37   30   34   38   41   44

Internal Network

28

FIG 13: Apparatus and software components that are used to protect new
client data to a local repository node

Fig. 14

70   71   57   58

50

Location Manager   Location Cache   Node Manager

Location Manager   Location Cache   Node Manager   70

54 — Data Mover

Replicator Service

LDAP Database

Data Mover

LDAP Database — 71

51 — Protection Policy

Protection Policy   Version Service — 59

repository node API

File Xfer   **Local repository node**

repository node API

File Xfer   **Remote repository node**

52

55   46   VP   VP   49   53   56   47

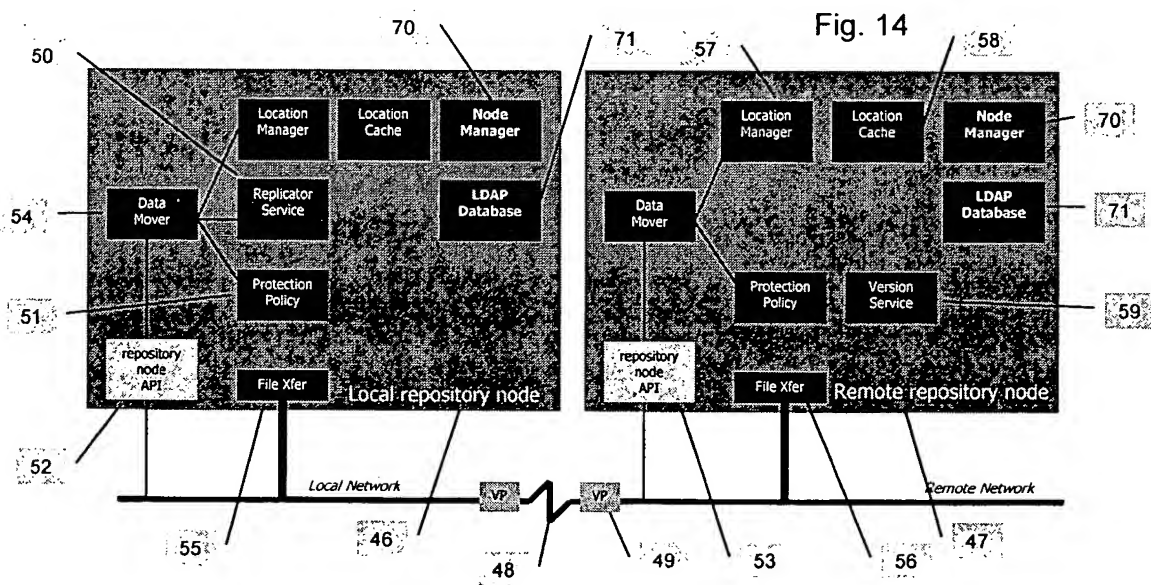*Local Network*   *Remote Network*

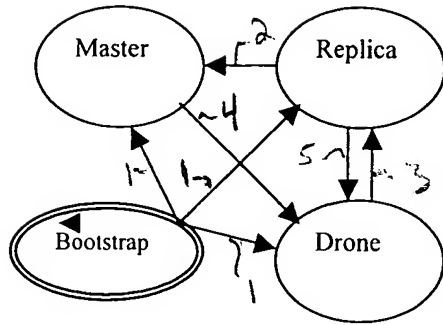48

FIG 14: Apparatus that replicates data among repositories

FIG 15: Node Manager Roles and state transitions